

What is claimed is:

1. A manufacturing fixture which is useful for manufacturing a magnet from a magnet powder, the magnet including a north pole, a south pole and a first region axis which extends between the north pole and the south pole, the manufacturing fixture comprising:

5 a fixture body including a fixture cavity for receiving the magnet powder, the fixture cavity having a cavity axis which is substantially parallel with the first region axis when the magnet is in the fixture cavity; and

10 an orientating device adapted to create a magnetic field having flux lines which extend through a portion of the fixture cavity, wherein a portion of the flux lines in the fixture cavity are angled relative to the cavity axis.

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2. The fixture of claim 1 wherein a portion of the flux lines in the
15 fixture cavity extend substantially transversely to the cavity axis.

3. The fixture of claim 1 wherein the fixture cavity includes a first cavity segment, a second cavity segment and a cavity transition between the first cavity segment and the second cavity segment, wherein a portion of the flux lines near the cavity transition extend substantially transversely to the
20 cavity axis.

4. The fixture of claim 3 wherein a portion of the flux lines in the fixture cavity are substantially parallel with the cavity axis.

5. The fixture of claim 4 wherein the flux lines in the cavity fixture
near a cavity perimeter are angled relative to the cavity axis.

6. The fixture of claim 1 wherein a portion of the flux lines in the fixture cavity are substantially parallel with the cavity axis.

7. The fixture of claim 1 wherein the flux lines in the cavity fixture near a cavity perimeter are angled relative to the cavity axis.

5 8. The fixture of claim 1 wherein the fixture cavity includes an upper side and a bottom side and the orientating device includes a coil positioned near one of the sides of the fixture cavity.

9. The fixture of claim 8 wherein the orientating device includes a pair of spaced apart, adjacent coils positioned near one of the sides of the fixture cavity.

10 10. The fixture of claim 1 including an upper punch which is adapted to move relative to the fixture body and compress the magnet powder in the fixture cavity and the orientating device is positioned near the upper punch.

11. A fixture which is useful for manufacturing a permanent magnet, the permanent magnet having a magnet body which is made of a magnet powder, the magnet body having a first segment which includes a first region and a second region, the first region having a first region axis which extends between a north pole and a south pole of the first region, the fixture comprising:

20 a fixture body including a fixture cavity which is adapted to receive the magnet powder; and

an orientating device adapted for aligning a portion of the magnet powder in the fixture cavity to form a powder pattern in the magnet body having second region powder lines in at least a portion of the second region which are angled relative to the first region axis.

12. The fixture of claim 11 wherein the orientating device is adapted to align a portion of the magnet powder so that the powder pattern has first region powder lines in at least a portion of the first region of the magnet which are substantially parallel with the first region axis.

5 13. The fixture of claim 11 wherein the fixture cavity has a cavity axis which is substantially parallel to the first region axis; wherein the orientating device is adapted to create flux lines which extend into the fixture cavity.

10 14. The fixture of claim 13 wherein the fixture cavity includes a first cavity segment, a second cavity segment and a cavity transition between the first cavity segment and the second cavity segment, wherein a portion of the flux lines near the cavity transition extend substantially transversely to the cavity axis.

15 15. The fixture of claim 14 wherein at least a portion of the flux lines in the fixture cavity are substantially parallel with the cavity axis.

16. The fixture of claim 15 wherein at least a portion of the flux lines in the fixture cavity near a cavity perimeter of the fixture cavity are angled relative to the cavity axis.

20 17. The fixture of claim 13 wherein at least a portion of the flux lines in the fixture cavity are substantially parallel with the cavity axis.

18. The fixture of claim 13 wherein at least a portion of the flux lines in the cavity fixture near a cavity perimeter are angled relative to the cavity axis.

19. The fixture of claim 11 wherein the fixture cavity includes an upper side and a bottom side and the orientating device includes a coil positioned near one of the sides of the fixture cavity.

20. The fixture of claim 11 wherein the orientating device includes a pair of spaced apart, adjacent coils positioned near one of the sides of the fixture cavity.

21. A method for manufacturing a magnet from a magnet powder, the magnet including a north pole, a south pole and a first region axis which extends between the north pole and the south pole, the method comprising the step of:

providing a fixture cavity, the fixture cavity having a cavity axis which is substantially parallel with the first region axis when the magnet is in the fixture cavity;

positioning the magnet powder in the fixture cavity, and

creating flux lines which extend through a portion of the fixture cavity, wherein a portion of the flux lines in the fixture cavity are angled relative to the cavity axis.

22. The method of claim 21 wherein the step of creating flux lines includes the step of creating flux lines in the fixture cavity which extend substantially transversely to the cavity axis.

23. The method of claim 21 wherein the step of providing a fixture cavity includes providing a fixture cavity having a first cavity segment, a second cavity segment and a cavity transition between the first cavity segment and the second cavity segment, and the step of creating flux lines includes creating flux lines near the transition which extend substantially transversely to the cavity axis.

24. The method of claim 23 wherein the step of creating flux lines includes creating flux lines in the fixture cavity which are substantially parallel with the cavity axis.

25. The method of claim 24 wherein the step of creating flux lines includes creating flux lines in the cavity fixture near a cavity perimeter which are angled relative to the cavity axis.

26. The method of claim 21 wherein the step of creating flux lines includes creating flux lines in the fixture cavity near a cavity perimeter which are angled relative to the cavity axis.

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